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with which he dealt. He would have been delighted, had he lived, to recognize the bearing of recent advances in science on the medicine of the tropics. Sir Ronald Ross devoted the main part of his lecture to tracing the history of the modern application of parasitology to etiology and pathology, dealing in particular with the growth of knowledge with regard to filaria, piroplasma and the malarial organisms. He sketched his own researches, the full history of which had, he said, been given in his Nobel lecture. It was only after several years' work that he recognized that the malarial infection was carried by a certain genus of mosquitoes only, not by *Culex* or *Stegomyia*, but by the anophelines. He made the observation that the spores of the analogous malarial parasites of birds which he had already recognized in *Culex* entered the insect's salivary or poison glands. This led to the disclosure of the full truth, namely, that the parasites were not only taken from man by the mosquitoes, as Manson had supposed, and not only put into man by the mosquitoes, as King supposed, but that both hypotheses were true, the insects carrying the parasites directly from man to man. Summarizing the results obtained, he said that from the time of the Romans it was known that the malarial fevers were connected with marshes and stagnant water in warm countries. Later, when it was seen that the disease was not confined to the proximity of marshes, the theorists conceived that there was a telluric poison which caused malaria and was especially abundant in damp places. All this was a very general proposition; and in order to prevent the disease, it was necessary to undertake very extensive drainage. The new knowledge obtained rendered it possible to particularize the exact route of infection. It was now known that the poison was not spread uniformly in the air of warm countries, but was always contained in the minute bodies of certain insects, and more than that, in the still more minute salivary glands of these creatures. The discovery of the full life-cycle of the parasites made it possible not only to predicate the route of infection, but to determine exactly which species of mosquitoes were

concerned, and to study the habits of the inculpatated species. The genera *Culex* and *Stegomyia*, which it was found did not carry the malarial parasite, breed most commonly in artificial collections of water around houses, the anophelines breed principally in natural collections of water such as marshes, puddles, streamlets and the edges of lakes, ponds and rivers. These observations showed the way to other inquiries which cleared up the epidemiology of yellow fever, sleeping sickness, tick fever, plague and might possibly throw light on that of dengue, Mediterranean fever and measles.

SCIENTIFIC NOTES AND NEWS

At the meeting of the American Society of Naturalists, held on December 31, 1914, Professor Hugo DeVries and Professor Wilhelm Roux were elected to honorary membership.

SIGNOR GUGLIELMO MARCONI has been appointed a member of the Italian senate by King Victor Emmanuel.

It is one of the privileges of the Spanish Academia de Medicina that it is entitled to a seat in the senate. The member of the academy recently elected senator in this way is Dr. B. G. Alvarez, one of the editors of the *Pediatría Española*.

DR. CHARLES R. VAN HISE, president of the University of Wisconsin, has been elected president of the Utilities Bureau, established as an agency for municipalities in their dealings with public utility companies.

DR. RAYMOND PEARL, of the Maine Agricultural Experiment Station, has been elected a member of the editorial board of the *Journal of Experimental Zoology*.

THE American Institute of Mining Engineers, the American Electrochemical Society and the Mining and Metallurgical Society of America are giving a complimentary dinner on Friday, January 15, at the Hotel Plaza to Dr. Frederick Gardner Cottrell, in charge of the San Francisco laboratory of the Bureau of Mines, in recognition of his contributions to research. It is well known that Dr. Cottrell assigned the patents for his process of electro-

static precipitation of fumes to the research corporation, the receipts from licenses to be used for the furtherance of research. As a result of this gift the research corporation is now in a flourishing condition.

THE new officers of the Society of American Bacteriologists are as follows:

President, D. H. Bergey, University of Pennsylvania, Philadelphia, Pa.

Vice-president, John Weinzirl, Seattle, Washington.

Secretary-Treasurer, A. Parker Hitchens, Glenolden, Pa.

Council, K. F. Kellerman, W. A. Stocking, R. E. Buchanan and H. J. Conn.

Delegate to the council of the A. A. A. S., M. J. Rosenau.

The council of the society has decided to hold the next annual meeting in Urbana, Illinois, on December 28, 29 and 30 of December, 1915. There will be a special meeting in the summer in San Francisco the date of which has not yet been fixed.

THE Paleontological Society at its recent Philadelphia meeting elected officers as follows:

President, E. O. Ulrich, Washington, D. C.

Vice-presidents, J. C. Merriam, Berkeley, Cal.; Gilbert Van Ingen, Princeton, N. J.; F. H. Knowlton, Washington, D. C.

Treasurer, R. S. Lull, New Haven, Conn.

Secretary, R. S. Bassler, Washington, D. C.

Editor, C. R. Eastman, New York.

DR. E. F. BASHFORD has resigned the post of general superintendent of the Imperial Cancer Research Fund, which he has held for the past eight years.

PROFESSOR W. H. KAVANAUGH, head of the experimental department of the college of engineering of the University of Minnesota, has been elected chairman of the Minnesota Section of the American Society of Mechanical Engineering.

F. C. DOSÉ has been appointed assistant in animal nutrition in the Pennsylvania Institute of Animal Nutrition.

DR. E. G. FEARNSIDES, Miss F. M. G. Micklethwait and Dr. E. P. Poulton have been elected to Beit Memorial Fellowships for Medical Research.

DR. J. WALTER FEWKES, ethnologist of the Bureau of American Ethnology, left Washington on January 6, to take up his fieldwork in Arizona. Incidentally he will represent the Smithsonian Institution at the inaugural ceremonies of Rufus Bernhard von Kleinsmid as president of the University of Arizona. The exercises occur on January 11 and 12, at Tucson, Arizona. At the conclusion of the ceremonies, Dr. Fewkes will continue his archeological work in that state, and then proceed to New Mexico to conduct researches concerning the early inhabitants of the lower Mimbres Valley, in connection with which the institution has recently published a report.

A SUCCESSFUL exploration tour through the wilds of Patagonia has been made by Dr. L. S. Rowe, of the University of Pennsylvania. Accompanied by the director of national territories and the governor of the Territory of Neuquen, Dr. Rowe traversed the southern section of the Argentine from the Atlantic to the Andes, and from parallel 37 to parallel 42 south. Dr. Rowe depicts in glowing colors the agricultural and industrial possibilities of this district, at one time looked upon as a desert region.

A CABLEGRAM from Cairo, Egypt, has been received at the University of Pennsylvania announcing the arrival of Dr. Clarence S. Fisher, leader of the university museum's Eckley B. Coxe, Jr., expedition, to make further excavations in Egypt.

PROFESSOR M. A. ROSANOFF, of the Mellon Institute and the Graduate School, University of Pittsburgh, lectured on January 4 and 5 before the New York University department of chemistry, on the partial vapor pressures of mixtures in their bearings on the theory of solutions and the theory of distillation.

DR. G. N. STEWART, of Western Reserve Medical School, lectured before the Syracuse Chapter of Sigma Xi on December 15, taking as his subject "The Physiologist in the Hospital and in the State." Other speakers this semester have been Dr. F. P. Knowlton, of the Syracuse Medical College, who spoke on

November 10 on "Hunger and Allied Phenomena" and Professor Henry A. Peck, of the Liberal Arts College, whose subject on November 17 was "Some Recent Aspects of the Nature and Extent of the Siderial Universe."

MR. CHARLES HALLOCK, the veteran author and naturalist, founder of *Forest and Stream* and the International Association for the Protection of Game, is now living at the John Dickson Home in Washington. He is full of interesting reminiscences. He tells the story that he first met the late Dr. Elliott Coues at the Smithsonian Institution when Coues was seventeen years old and took him with him on an expedition to Labrador in 1860. They made large collections and placed 164 skins in the late E. D. Cope's museum at Philadelphia. Mr. Hallock would be glad to hear from any of his old friends.

At the annual meeting of the Mathematical Association, January 9, the president, Sir George Greenhill, gave an address on mathematics in artillery science.

MR. HILAIRE BELLOC gave the presidential address at the annual meeting of the Geographical Association, held on January 7, at the University of London.

A MEETING in commemoration of the four hundredth birthday anniversary of Vesalius was held at the New York Academy of Medicine, January 7, at which Dr. William H. Welch, of the Johns Hopkins University, delivered an address on "Vesalius and the Spirit of the Time"; Dr. Fielding H. Garrison, editor of the *Index Medicus*, spoke on "Anatomical Illustration Before and After Vesalius," and Dr. Harvey Cushing, of the Harvard Medical School, delivered a lecture on "The Portraits of Vesalius," illustrated by lantern slides.

PROFESSOR N. C. DUNÉR, the distinguished Swedish astronomer, secretary of the Swedish Royal Society of Science, died on November 10, at the age of seventy-five years.

THE U. S. Civil Service Commission announces an examination on February 2, for engineer of mine-safety investigations in the

Bureau of Mines, Department of the Interior, at New York, N. Y., at a salary ranging from \$3,000 to \$3,600 a year. It also announces an examination for specialist in cotton testing in the Office of Markets and Rural Organization, Department of Agriculture, Washington, D. C., at salaries ranging from \$1,800 to \$3,000 a year.

THE Rockefeller Institute for Medical Research will receive \$200,000 under the will of Henry Rutherford, for cancer research work. This bequest was threatened by a contest of the will filed by a cousin of the testator, but the contest was dismissed and the will admitted to probate.

A VIENNA medical journal, as quoted in the *Journal* of the American Medical Association, reports 844 cases of cholera with 331 deaths in Austria during the week ended November 7, including 90 cases in Vienna with 10 deaths. During the following week there were 78 cases in Vienna with 19 deaths.

THE international service of astronomical telegrams from Kiel having been interrupted by the war, the management of the "Zentral-stelle" has been passed over to Professor Elis Strömgren, Copenhagen Observatory.

THE Entomological Society of France has resumed the publication of its *Bulletin*. No. 15 of 1914 has just reached this country. At the meeting of October 14, the president, M. Alluaud, in addressing the society stated that in the absence of both of the secretaries at the front the publication of Nos. 13 and 14 had been delayed. He urged members still remaining in Paris not to interrupt the regular meetings under any pretext and to attend regularly. He quoted the speech made by Doctor Laboulbène at the meeting of January 11, 1871, during the siege of Paris, in which the same course was urged. He further stated that a bomb had been dropped by an aeroplane very near the Museum of Natural History the day before the meeting. He stated that MM. Reymond Morgon and André Vuillet had fallen in battle. Vuillet was well known in this country on account of his publications relating to the gipsy moth and its parasites.

He was killed in an assault on September 10 at Ippecourt. Both of the secretaries, Dr. R. Jeannel and Dr. Maurice Royer, were at the front but in good health.

WE learn from *The Observatory* that it is proposed to recommence the publication of the *Gazette Astronomique*, formerly issued by the Astronomical Society of Antwerp. The occupation of that town by the Germans occasioned the temporary suspension of the *Gazette*. A number of English astronomers, on the initiative of Mrs. Fiammetta Wilson, of Bexley Heath, have promised to aid by pecuniary assistance and literary contributions. It is intended to issue the *Gazette* monthly unless funds and the material for printing should justify publication at shorter intervals. The minimum subscription will be five shillings, but those who are able and willing to aid more generously may subscribe half a guinea or a guinea as a more effective means of carrying out the idea of their Belgian comrades. The *Gazette* will be published in French and English, and will be devoted to general astronomical subjects. It is hoped that the first number of the new issue will be ready early in January. Subscriptions and correspondence should be addressed to Felix de Roy, hon. sec., 29 Stamford St., London, S.E.

DR. GEORGE D. HUBBARD, head of the department of geology at Oberlin College, has issued a bulletin covering the work of the Oberlin Geological Survey during the summer. From June 25 to August 14, Dr. Hubbard conducted a field survey in geology at Glen Lyn, Virginia. The party consisted of Professor and Mrs. Hubbard and nine students, eight men and one woman. Three of the students were graduates; seven were Oberlin men; one came from the University of Cincinnati, and one from Houghton Seminary, New York. The work consisted of the making of a topographic map by means of transit and plane-table, and the making of a geologic map of about 40 square miles of hilly country, partly in the folded strata of the Appalachians and partly in the dissected Allegheny plateau of nearly horizontal strata. A large collection of rocks and fossils was made;

among the latter were several species of crinoids hitherto unknown in the Mississippian rocks of this locality. These collections are now being prepared and mounted for the Oberlin Geological Museum.

WITH a view to prolonging the original survey of the Palestine Exploration Fund to the Egyptian frontier, and so connecting it with recent work of the Egyptian Survey Department, a survey has been carried out under the auspices of the same fund by parties headed by Captain S. F. Newcombe, R.E. In a report, written at Akaba in February of this year and printed in the July number of the *Quarterly Statement* of the Fund, of which we learn from the *Scottish Geographical Journal*, Captain Newcombe describes the general program of the survey, and the progress of the work to date, while a postscript written in June records the return of the party to this country after completing its labors. The area in question was but imperfectly known, and the results are of some interest apart from their purely cartographical value. Five parties were engaged in the work, and the map was made on the scale of 1:125,000, roughly contoured at 100-foot intervals. A triangulation was effected, the fixed points of the Siani boundary determined by the Egyptian survey being carried further east, while in the north a chain of triangles was carried across to connect with the original Palestine survey. In the south it was possible to save time and expense by observing large triangles, the exterior points—Mount Hor and Jebel Taba—being observed from two mutually visible fixed points over 40 miles apart on the Egyptian frontier, and a framework thus supplied into which subsidiary points could be easily fitted. The main difficulties encountered were concerned with transport, and the procuring of guides and supplies, with a certain amount of hostility on the part of the Arabs, but these were on the whole successfully overcome. A small area near Akaba had to be left unsurveyed owing to the unwillingness of the Turkish authorities to give the required permission. This was, however, mapped by Major Kitchener in 1883. The summit of Mount Hor

(where the size and bright coloring of "Aaron's tomb" were a distinct aid in the observation of rays over 55 miles in length) was fixed, relatively to the Siani survey, with a probable error of only 30 feet. The other results of the survey are mainly concerned with archeology, in the interests of which Messrs. Woolley and Lawrence, archeologists connected with the British Museum, were attached to the expedition for part of the time. Special care was devoted to the accurate collection of names of localities, which were taken down, as pronounced by the guides, by an educated Syrian of the party. That of "Theigat el-Amirin," thought by Professor Palmer to be possibly a relic of the Amorites, turned out to refer to a tribal fight of about 150 years ago between the Azazma and Amiri tribes. The Bedawin of this desert region seem to have moved there only within the last 500 years. All roads have been inserted in the new map, and a point of interest is the discovery that the direct route from Kadesh to Mount Hor is an easy road, though thought by earlier writers to be impossible.

THE *Royal Engineers' Journal* for May of this year contains, according to *The Geographical Journal*, an account by Captain C. W. Biggs, R.E., of a recent somewhat serious encroachment of the sea at Fort Ricasoli, Malta, and of the measures taken to cope with it. The paper is illustrated by plans and photographs. The site of the encroachment is a line of weakness, due apparently to a fault in the rock structure, traversing the peninsula on which Fort Ricasoli is placed, on the north-east of the Grand Harbor. The trace of the bastion walls built by the knights of Malta about 1670, shows that even then the inlet on the line of fault existed. The winter storms have gradually eaten into the fault and burrowed a tunnel beneath the cliff, from which a sort of chimney was formed leading to the parade grounds above. Measures were therefore necessary to stop the encroachment, the proposal adopted being one for the creation of a breakwater across the mouth of the inlet by means of a number of concrete blocks chained together. The work has been con-

tinued for several successive years, the comparatively small blocks used at first proving inadequate to withstand the heavy seas. Some were washed out to the front, while others sank in the sand. The weight of the blocks was progressively increased until at last it reached fifty tons each, and this seems to have had a satisfactory result. Although some of the blocks have been shifted by the winter storms, this has now taken place *inwards*, while the sea has helped to defeat itself by piling up material behind the breakwater. All that is thought necessary for the future is the addition of more large blocks from time to time, and continued filling in behind them.

IN the thirty-fifth annual report of the United States Geological Survey, Mr. Geo. Otis Smith, the director, discusses particularly the province of the federal survey. An amendment which was offered in Congress to last year's appropriation bill would, if passed, have restricted the geologic work of the survey to the public lands. As the amendment failed the only result was to attract more attention to the basic investigative work of the survey, which embraces all the lands of the United States, the privately owned as well as the public lands. The examination of private property for private purposes is forbidden by the organic act of the survey, but the examination of private lands must be included in any general investigation. The determinative factor in the whole matter is whether the investigative work on privately owned lands yields results that are merely of local and personal interest or results that are of general and national value. Land ownership is only an incident when large questions of natural resources are considered. The special interest of the government in its own lands—the public lands—being granted, it must be added, as was suggested last year by Representative Sherley at a hearing before the House Appropriations Committee, that "So far as the development of the mineral resources of the country is concerned, it is just as important to know the resources of privately owned land as of government-owned land." When it is remembered that in the First Annual Report

of the Geological Survey Director King prophesied for the United States a future annual output of mineral products having a value of a billion dollars, and that the present production is two and one half times that amount, it must be conceded that the desirability of the federal scientific investigations of these national resources is even greater than in 1880. "It is a most conservative statement," Director Smith says, "that at no date has the general public been in closer touch with the United States Geological Survey or made larger use of the published or unpublished results of its surveys and investigations than at the present time."

UNIVERSITY AND EDUCATIONAL NEWS

A BEQUEST of \$3,000,000 to Oberlin College by Charles M. Hall, the distinguished electro-chemist and manufacturer of aluminum, is announced. The bequest is in the form of \$2,000,000 endowment to be used for any purpose, \$500,000 to be used to build an auditorium, \$100,000 for the auditorium's maintenance, \$200,000 to be spent for campus improvements; all property in Oberlin owned by Dr. Hall, and a valuable art collection.

THE will of Miss Grace Hoadley Dodge, for many years known for her educational and philanthropic activities in New York City, contains bequests of \$1,400,000 for educational and charitable purposes, as well as a number of deferred bequests of the same character. The sum of \$500,000 is bequeathed to Teachers College, Columbia University, in the founding and conduct of which she took an active part. The college will receive two deferred bequests, one of which may be large. To the National Board of the Y. W. C. A. the sum of \$500,000 is left, and to the Y. W. C. A. of New York City, \$200,000.

At the meeting of the corporation of Harvard University on December 28, it was voted to establish a separate faculty for the Bussey Institution. The vote was consented to by the board of overseers, and the new body at present includes the following members: W. M. Wheeler, Ph.D.; W. E. Castle, Ph.D.; R. T.

Fisher, A.B., M.F.; E. M. East, Ph.D.; C. T. Brues, S.M.; I. W. Bailey, A.B., M.F., and C. C. Little, S.D., of the Bussey Institution; G. H. Parker, S.D. and W. J. V. Osterhout, Ph.D., of the faculty of arts and sciences; and E. E. Tyzzer, A.M., M.D., of the medical school.

DR. C. E. BURKE, lately of the University of California, has been appointed instructor in the department of chemistry at the University of Vermont.

DR. HOWARD D. HASKINS, formerly associate professor of bio-chemistry in the school of medicine of Western Reserve University, has been appointed professor of bio-chemistry in the medical department of the University of Oregon.

DR. FREDERICK D. HEALD, of Philadelphia, has been appointed professor of plant pathology and pathologist, Washington State College and Experiment Station, Pullman, Washington.

DISCUSSION AND CORRESPONDENCE

BATESON'S ADDRESS, MENDELISM AND MUTATION

IN Bateson's thoughtful and stimulating address,¹ a recognized authority on evolution attempts to summarize for us recent progress in the study of that subject by analytical methods. It would be well for all engaged in some particular branch of this subject to attempt thus to lift the eyes from the scene of their individual labors and survey from time to time the entire field. An indispensable sense of proportion and perspective is thus gained. This is my excuse for commenting briefly on some of Bateson's fruitful ideas.

That evolution occurs all biologists agree. That the organisms now existing on this earth are different from those which formerly existed here no one questions. But we are still ignorant of how they came to be different. The geological record indicates that the change was gradual. The supposed ancestors of the horse,

¹ Bateson, W., Address of the President of the British Association for the Advancement of Science, *SCIENCE*, N. S., 40, pp. 287-302, August 28, 1914.